

Mumbai University

Question Paper

May – 2016

[B.Sc.IT – SEMESTER: VI]
(IDOL – REVISED COURSE)

- ❖ INTERNET TECHNOLOGIES
- ❖ DIGITAL SIGNALS AND SYSTEMS
- ❖ DATA WAREHOUSING
- ❖ PROJECT MANAGEMENT

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Question Paper

**[IDOL – REVISED COURSE]
(MAY – 2016)**

PAPER - I

**INTERNET
TECHNOLOGIES**

Time: 3 Hours**Total Marks:** 100**N.B.:** (1) All Question are Compulsory.

(2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.

(3) Answer To The Same Question Must Be Written Together.

(4) Number To The Right Indicates Marks.

(5) Draw Neat Labeled Diagrams Wherever Necessary.

(6) Use of Non – Programmable Calculator is allowed.

Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

- (A) Explain the algorithm used to form shortest path tree with suitable example. (5)
- (B) What are the services provided by UDP? (5)
- (C) How does DHCP Allocate Address dynamically? (5)
- (D) Explain the format of SNMP PDU Format? (5)

Q.2 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Describe the functions of the Physical Layer in the OSI Model. (5)
- (B) State and explain five points of comparison between IPv4 and IPv6. (5)
- (C) Explain the different kinds of classes along with their Network Mask for IPv4 Address. (5)
- (D) State and explain Fragmentation Module of IP Package. (5)
- (E) Explain the Transition Strategies from IPv4 to IPv6. (5)
- (F) Write a note on Classless Addressing. (5)

Q.3 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Write a note on Proxy ARP. (5)
- (B) What is inefficiency in Mobile IP? Give solution for it. (5)
- (C) Explain Timers in RIP. (5)
- (D) What are the three phases that a mobile host should go through to communicate with the Remote Host? (5)
- (E) Explain the Source Quench Message and Time Exceeded Message in ICMPv4. (5)
- (F) List types of OSPF Packets. Explain Hello Packet in detail. (5)

Q.4 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Explain Stop-and-Wait Protocol and Go-Back-N Protocol in the Transport Layer. (5)
- (B) Explain the features of Stream Control Transmission Protocol. (5)
- (C) Explain Half Close in TCP. (5)
- (D) Explain Control Block Module of UDP with Algorithm. (5)
- (E) A TCP Connection is in the ESTABLISHED state. The following events occur one after another: (5)
 - (i) A FIN Segment is received.
 - (ii) The application sends a "close" Message.What is the state of the connection after each event? What is the action after each Event?
- (F) Draw and explain state transition diagram of SCTP. (5)

Q.5 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) What are the types of records used in Domain Name System? (5)
- (B) Explain Recursive and Iterative resolution in DNS. (5)
- (C) What Data Structures FTP uses to transfer a File Across Data Connection? (5)
- (D) What are the types of TFTP Messages? What is the purpose of each one? (5)
- (E) Explain the Packet Format of SSH. (5)
- (F) How do you establish Connection in TFTP? (5)

[TURN OVER]

Q.6 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Explain the format of the Response Message of HTTP. (5)
- (B) What is difference between Persistent and Non-Persistent Connection of TCP? (5)
- (C) Write a note on POP3. (5)
- (D) What is the concept of SMI in SNMP? (5)
- (E) How to access MIB Variables? (5)
- (F) How do you download a compressed audio/video using web server with metafile? (5)

Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Write a TCP program to find whether number sent by client is prime or not. (5)
 - (B) Write a UDP Server Code to find Factorial of a number. (5)
 - (C) Explain DatagramPacket Class. (5)
 - (D) Write a note on TCP Programming. (5)
 - (E) Write a TCP Program to find whether string is Palindrome or not. (5)
 - (F) Write a UDP Server Code to find inverse of string. (5)
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Mumbai University

Question Paper

**[IDOL – REVISED COURSE]
(MAY – 2016)**

PAPER - II

DIGITAL

SIGNALS AND SYSTEMS

Time: 3 Hours

Total Marks: 100

N.B.: (1) All Question are Compulsory.

(2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.

(3) Answer To The Same Question Must Be Written Together.

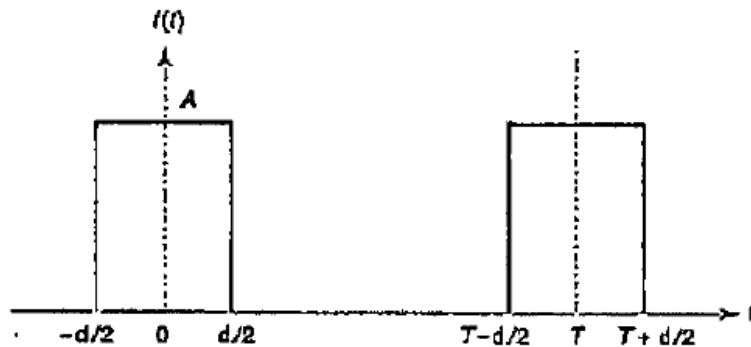
(4) Number To The Right Indicates Marks.

(5) Draw Neat Labeled Diagrams Wherever Necessary.

(6) Use of Non – Programmable Calculator is allowed.

Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

- (A) What are the advantages of digital filters? Explain. (5)
- (B) Check whether the system given by $F[x(n)] = e^{x(n)}$ is linear or not. (5)
- (C) How are signals classified? Explain. (5)
- (D) Deduce the Fourier series for the waveform of a positive going rectangular pulse train shown. (5)

**Q.2 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

- (A) Determine the Fourier transform of Signum function and plot amplitude and phase spectra. (5)
- (B) State any ten properties of unit impulse function $\delta(t)$. (5)
- (C) What is meant by sampling? State sampling theorem. (5)
- (D) Write a note on Dirichlet's conditions. (5)
- (E) With neat labelled block program explain how analog signal gets converted into digital signals. (5)
- (F) Find the Fourier transform for the signal described as: (5)

$$f(t) = \begin{cases} 1 & -2 \leq t \leq -1 \\ 2 & -1 \leq t \leq 1 \\ 1 & 1 \leq t \leq 2 \end{cases}$$

Q.3 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Find the Laplace transform of $\sin at \cdot \sin bt$ (5)
- (B) Obtain Laplace transform for step and Impulse Responses of a series R-L Circuit. (5)
- (C) Discuss final value theorem in Laplace transform domain. (5)
- (D) Find the Laplace Transform of: (5)
- (i) $e^{-t} \sin 4t$
- (ii) $e^{2t} + 2te^{-2t} - t^2$
- (E) Find inverse Laplace transform of $F_2(s) = \frac{3e^{-\frac{s}{2}}}{s^2(s^2+2)}$ (5)
- (F) Explain the significance of pole-zero diagram in circuit analysis? How can the time domain response be determined from pole-zero plot? (5)

[Turn Over]

Q.4 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) What are the condition for z-Transform to exist? Explain. (5)

(B) Determine the Z-Transform and the region of convergence of (5)

$$x(n) = \begin{cases} 2^n & n \geq 0 \\ 0 & n < 0 \end{cases}$$

(C) Determine the convolution of the two sequences $x(n) = \{2, 1, 0, 0, 5\}$ and (5)

$$h(n) = \{2, 2, 1, 1\}$$

(D) Compare the properties of two-sided z-transform with those of one-sided z-Transform. (5)

(E) Using convolution find $x(n)$ if $X(z)$ is given by: (5)

$$x(n) = \frac{1}{\left(1 - \frac{1}{2}z^{-1}\right)\left(1 + \frac{1}{4}z^{-1}\right)}$$

(F) Find $x(n)$ if $X(z) = \frac{z+3}{z^7\left(z-\frac{1}{2}\right)}$ (5)**Q.5 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

(A) What is convolution in Linear Time Invariant System? What are the properties of convolution? (5)

(B) Check whether the following systems are BIBO stable or not (5)

$$(i) \quad y(n) = ax(n+1) + bxh(n-1)$$

$$(ii) \quad y(n) = ax(n).x(n-1)$$

(C) The output $y(n)$ for an Linear Time Invariant system to the input $x(n)$ is $y(n) = x(n) - 2x(n-1) + x(n-2)$. Compute the magnitude and phase of the frequency response of the system for $|\omega| \geq \pi$ (5)(D) Compute the response of the system $y(n) = 0.7y(n-1) - 0.12y(n-2) + x(n-1) + x(n-2)$ to the input $x(n) = nu(n)$ (5)

(E) What is frequency response? What are the properties of frequency response? (5)

(F) Obtain Frequency Response for $y(n) = x(n) + 10y(n-1)$ with initial condition $y(-1) = 0$. (5)**Q.6 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**(A) Determine DFT of the sequence $x(n) = \begin{cases} 1 & 0 \leq n \leq 2 \\ 4 & 0 \leq n \leq 2 \\ 0 & \text{otherwise} \end{cases}$ (5)

(B) Define Discrete Time Fourier Transform (DTFT) and Inverse Discrete Time Fourier Transform (IDTFT). Explain the difference between Discrete Fourier Transform (DFT) and Discrete Time Fourier Transform (DTFT). (5)

(C) Consider two periodic sequences $x(n)$ and $y(n)$ with period M and N respectively. The sequence $w(n)$ is defined as $y(n) = x(n) + y(n)$. Show that $w(n)$ is periodic with period MN. (5)(D) Obtain $X(k)$ for the sequence $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ using Decimation-in-Time (DIT), Fast Fourier Transform (FFT) Algorithm. (5)(E) Compute Linear and Circular Periodic Convolutions of the sequence $x_1(n) = \{1, 1, 2, 2\}$ and $x_2(n) = \{1, 2, 3, 4\}$ using DFT. (5)

(F) Define discrete Fourier transform. Explain any five properties of discrete Fourier transform. (5)

Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

(A) What is an IIR filter? Compare its characteristics with an FIR filter. (5)

(B) Explain the procedure for designing an FIR Filter using Kaiser Window. (5)

(C) Explain the effects of windowing. Define Rectangular and Hamming Window functions. (5)

(D) Describe elliptical filter in detail. (5)

(E) Write a short note on Chebyshev filters. (5)

(F) Write a short note on Butterworth filters. (5)

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**[IDOL – REVISED COURSE]
(MAY – 2016)**

PAPER - III

DATA

WAREHOUSING

Time: 3 Hours**Total Marks:** 100**N.B.:** (1) All Question are Compulsory.

(2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.

(3) Answer To The Same Question Must Be Written Together.

(4) Number To The Right Indicates Marks.

(5) Draw Neat Labeled Diagrams Wherever Necessary.

(6) Use of Non – Programmable Calculator is allowed.

Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

- (A) Explain the term Data Warehouse. (5)
- (B) What is the importance of metadata in the Data Warehouse? (5)
- (C) What are the two common types of transactions in Data Warehousing? (5)
- (D) How the data is protected in Data Warehouse? (5)

Q.2 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Discuss the impact of the Data Warehouse on Business. (5)
- (B) Discuss the problems related with Federated Data Warehouse. (5)
- (C) Discuss the Fundamental Operating differences between the various sectors in Data Warehouse. (5)
- (D) Explain by giving example structured and unstructured data with respect to a Data Warehouse. (5)
- (E) What is the significance of referential integrity of the data in the Data Warehouse? (5)
- (F) The challenges of incorporating unstructured data with structured data in a Data Warehouse are many. What are they? (5)

Q.3 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Write a short note on Active and Passive Metadata Repositories in a Data Warehouse. (5)
- (B) Explain the term Taxonomy related to unstructured Data Warehouse. What are its types? (5)
- (C) Explain the role of Total Information Quality Management stream with respect to seven stream approach to Data Warehouse. (5)
- (D) What is meant by Heuristic Analysis of data in a Data Warehouse? (5)
- (E) Differentiate Data Mart and Exploration Facility with respect to a Data Warehouse. (5)
- (F) Explain Data Profiling and Mapping Stream it seven stream approach to Data Warehouse. (5)

Q.4 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Explain corporate data model with respect to a data warehouse. (5)
- (B) Write a short note on Transformation of Data made as data passes from the Application / Interactive Sector to the Integrated Sector? (5)
- (C) Discuss the relationship between Data Models and Unstructured Data. (5)
- (D) What is the role of data quality monitor in a data warehouse? (5)
- (E) Why is the Data Warehouse Monitor a standard recommendation for DW 2.0 environment? (5)
- (F) Write a short note on Document Data. (5)

Q.5 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Differentiate between Discrete Time-Variant Data and Continuous Time Span Time-Variant Data. (5)
- (B) How does data flow into the Integrated Sector of a Data Warehouse? (5)
- (C) Data flow into near Line Sector of a data warehouse is considered optional. Why? (5)
- (D) How is the term "Exception-Based Flow of Data" associated with flow of data in a Data Warehouse? (5)
- (E) Discuss the points to be taken care of when source-to-target mapping of each unit of data has to be done to form a Data Warehouse. (5)
- (F) Data throughput is a major concern with ETL processing. Justify. (5)

[TURN OVER]

Q.6 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) How Indexing Technique helps to improve performance of a Data Warehouse? (5)
- (B) How is migration of unstructured data different from navigation of structured data in a Data Warehouse? (5)
- (C) Discuss the importance of good online response time to increase the performance of a Data Warehouse. (5)
- (D) What are the different functions of the granularity manager in a Data Warehouse? (5)
- (E) Capacity planning puts the organization in a proactive stance when it comes to performance. Justify. (5)
- (F) Parallelization of processing is a really good way to enhance performance. Justify. (5)

Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Write a short note on an Optimizing Storage. (5)
 - (B) Explain with an example Data Clustering. (5)
 - (C) What are the techniques to improve the performance of data warehouse? (5)
 - (D) What is the advantage of using pilot systems? (5)
 - (E) Explain the procedure of loading dimension tables before the fact tables. (5)
 - (F) Write a short note on user acceptance procedure. (5)
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Question Paper

**[IDOL – REVISED COURSE]
(MAY – 2016)**

PAPER - IV

ELECTIVE

**PROJECT
MANAGEMENT**

Time: 3 Hours**Total Marks:** 100**N.B.:** (1) All Question are Compulsory.

(2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.

(3) Answer To The Same Question Must Be Written Together.

(4) Number To The Right Indicates Marks.

(5) Draw Neat Labeled Diagrams Wherever Necessary.

(6) Use of Non – Programmable Calculator is allowed.

Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)

- (A) What are the strategies to make Error-Free Software? (5)
- (B) Give a brief outline on The Management Artifact Sets. (5)
- (C) Hi-Tech IT Company is a 50 Employee's organization. It has to develop a Project on "Hospitality Management". Company is expert in developing Moderate Sized Projects. (5)
- (D) State the Traits of Modern Process of Development. (5)

Q.2 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) How can we improve the term effectiveness? (5)
- (B) What kind of strategies can be applied to improve Team effectiveness? (5)
- (C) Explain the generation of Software Development. (5)
- (D) How can we Reduce the Software Product Size? Explain in detail. (5)
- (E) Write detail note on Pragmatic Software Cost Estimation. (5)
- (F) Present the Boehm's Top-10 Software metrics list in detail. (5)

Q.3 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Explain any five Davi's principle of Conventional Software Management? (5)
- (B) Write a short note on Technical Perspective Architecture. (5)
- (C) Explain the principles of Modern Software Management? (5)
- (D) Explain Vision Document in Engineering artifact with its structure. (5)
- (E) Explain the template of Business Case. (5)
- (F) For each of the Inception and Transition Phase explain following thigs: (5)
- (i) Starting & Ending Point
 - (ii) Objectives
 - (iii) Activities
 - (iv) Evaluation Criteria

Q.4 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) List and explain the seven top level software process workflows. (5)
- (B) Explain the principles of modern software engineering? (5)
- (C) What is the significance of Periodic Assessments? (5)
- (D) Discuss the cost and Schedule Estimating Process. (5)
- (E) Write a short note on interaction workflows. (5)
- (F) Define a WBS. Explain the Evolutionary WBS? (5)

[TURN OVER]

Q.5 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Which types of Automation tools we can use to automate the seven work flows? (5)
- (B) Explain the roles, artifacts and responsibilities of the term responsibilities for planning? (5)
- (C) Explain in brief about the process automation? (5)
- (D) Explain the term "Software Project Team Evolution". (5)
- (E) Explain four important Environment disciplines of environment evolution. (5)
- (F) Enlist the set of activities evolved over the life-cycle. Explain the same. (5)

Q.6 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Describe any five core metrics for Project Control and Process Instrumentation. (5)
- (B) What is scale of the project? Explain different type of projects according to the scale. (5)
- (C) Compare and contrast Small-Scale and Large-Scale Projects. (5)
- (D) Describe the four Quality Indicators in detail. (5)
- (E) Describe the seven Core Metrics for Projects Control and Process Instrumentation. (5)
- (F) Write detail note on Management Indicators. (5)

Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)

- (A) Enlist the various principles of Modern Project Management. (5)
 - (B) Explain a general structure for a cost estimation model IN Modern Software process. (5)
 - (C) What is Early Risk Resolution? How it is carried out in the interactive process as early in the life cycle? Give its advantages. (5)
 - (D) Explain in detail the culture shifts in Modern Process Transition. (5)
 - (E) What is Early Risk Resolution? Give its advantages. (5)
 - (F) How does cost estimation server as the potential solution for modern software project management? Explain with neat diagram. (5)
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